

## PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2001-272208

(43)Date of publication of application : 05.10.2001

(51)Int.Cl.

G01B 11/00  
G03F 9/00  
H01L 21/02  
H01L 21/027

(21)Application number : 2000-087008

(71)Applicant : TOSHIBA CORP

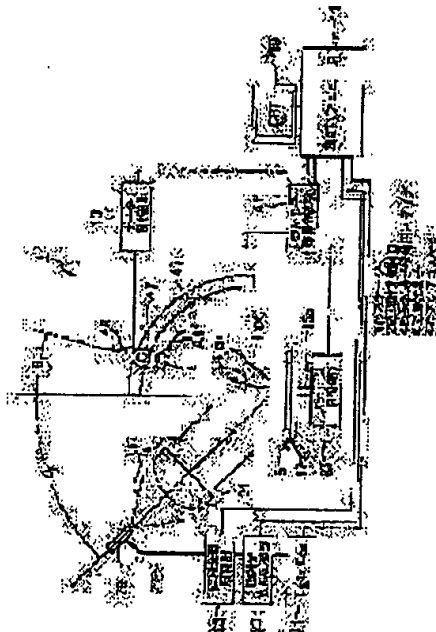
(22)Date of filing : 27.03.2000

(72)Inventor : KITAGAWA TAKAHIRO

**(54) SUPERPOSING DEVIATION INSPECTION APPARATUS, AND MARK FOR INSPECTING SUPERPOSING DEVIATION AND SUPERPOSING DEVIATION INSPECTION METHOD****(57)Abstract**

**PROBLEM TO BE SOLVED:** To provide a superposing deviation inspection apparatus, marks for inspecting superposing deviations and overlap deviation inspection method, which enable automatic inspection of the presence of a superposing deviation in a shorter time between a lower layer pattern and a resist pattern, in a lithographic process during the production process of semiconductors.

**SOLUTION:** There are arranged a state 17, which carries a substrate S containing a lower layer patterns 61 that is designed to be arranged alternately to make a diffraction grating with a cycle width (p), a pattern for forming an element as resist pattern 65 and marks 60 to be inspected formed individually along with the resist pattern, an irradiation element 29 which radiates a parallel monochromatic light LI having a wavelength  $\lambda$  for irradiating the marks 60 from the direction that gives the cycle (p) at an arbitrary angle  $\theta_i$  of incidence, a photodetection means 45 for detecting a m-th order diffraction light LDm generated from the marks 60 as irradiated with the parallel monochromatic light LI and a determining means 13 to determine the presence of a superposing deviation between the lower layer pattern 61 and the resist pattern 65, based on the expression  $p(\sin\theta_m - \sin\theta_i) = \pm m\lambda$  obtained from the cycle p, incidence angle  $\theta_i$ , exiting angle  $\theta_m$  of the m-th order diffraction light LDm.

**LEGAL STATUS**

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision  
of rejection]

[Date of requesting appeal against examiner's  
decision of rejection]

[Date of extinction of right]

Copyright (C): 1998,2000 Japan Patent Office

